Precoder and TxEq request handshake

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Request Flags for Precoder changes

Table 45–90ah—PMA precoder request status register bit definitions

Bit(s)	Name	Description	R/W[a]
1.604.15:2	Reserved	Value always 0	RO
1.604.1	Tx input precoder request status	1 = Tx input precoding requested 0 = Tx input precoding not requested	RO
1.604.0	Rx input precoder request status	1 = Rx input precoding requested 0 = Rx input precoding not requested	RO

[a]RO = Read only

45.2.1.116l.1 Tx input precoder request status (1.604.1)

This bit indicates the Tx input precoder request status.

45.2.1.116l.2 Rx input precoder request status (1.604.0)

This bit indicates the Rx input precoder request status.

A 50GAUI-1 C2C or 100GAUI-2 C2C input may generate a request to change the precoder state of the remote output by setting the variable request_precoder_tx_in_flag or request_precoder_rx_in_flag to 1. The variables request_precoder_tx_in_*i* and request_precoder_rx_in_*i* (where *i* is 0 or 1) indicate the requested transmitter precoder state for the corresponding interface and lane. A request from a 50GAUI-1 C2C or 100GAUI-2 C2C receiver is generated in an implementation specific manner.

When a 50GAUI-1 C2C or 100GAUI-2 C2C receiver does not request a change of the remote transmitter's transmit setting, it sets request_precoder_tx_in_flag or request_precoder_rx_in_flag to 0. A 50GAUI-1 C2C or 100GAUI-2 C2C receiver that does not implement transmitter precoder request always sets request_precoder_tx_in_flag or request_precoder_rx_in_flag to 0.

If a Clause 45 MDIO is implemented, the variables request_precoder_rx_in_flag and request_precoder_tx_in_flag are accessible through register 1.604 (see 45.2.1.116l), variables request_precoder_rx_in_*i* are accessible through register 1.605 (see 45.2.1.116m), and variables request_precoder_tx_in_*i* are accessible through register 1.606 (see 45.2.1.116n).

The concern

- Once per reset, the local side gets to decide if the precoder should be on or off.
  - You get 1 shot at making the “correct” choice.
- When does the local side know the remote has adjusted it’s precoder state?
  - It currently doesn’t. So the only option when requesting it on is to activate the local precoder when you assert the request_flag.
- Since you have no idea when the update is done, you can’t lower and re-assert the request to change your mind.
- You have know idea when or if the pervasive management entity will service the request.

Request Flags for TxEq changes

Table 45–90ab—200GAUI-n and 400GAUI-n chip-to-chip transmitter equalization, receive direction, lane 0 register bit definitions

Bit(s)	Name	Description	R/W[a]
1.500.15	Request flag	1 = Change in equalization is requested 0 = No change in equalization is requested	RO
1.500.14:12	Post-cursor request	14 13 12 1 1 1 Reserved 1 1 0 Reserved 1 0 1 *Requested_eq_c1* = 5 (c(1) ratio –0.25) 1 0 0 *Requested_eq_c1* = 4 (c(1) ratio –0.2) 0 1 1 *Requested_eq_c1* = 3 (c(1) ratio –0.15) 0 1 0 *Requested_eq_c1* = 2 (c(1) ratio –0.1) 0 0 1 *Requested_eq_c1* = 1 (c(1) ratio –0.05) 0 0 0 *Requested_eq_c1* = 0 (c(1) ratio 0)	RO

45.2.1.116d.1 Request flag (1.500.15)

The value of this bit indicates the value of the variable *Request_flag* in the lane 0 200GAUI-n or 400GAUI-n receiver in the receive direction (see 120B.3.2 and 120D.3.2.3). This indicates whether the 200GAUI-n or 400GAUI-n chip-to-chip device is issuing a request to change the remote transmitter equalization in the 200GAUI-n or 400GAUI-n chip-to-chip lane 0 transmitter in the receive direction. If a lane 0 200GAUI-n or 400GAUI-n receiver in the receive direction is not present in the package, then the value returned for this bit should be zero.

Concern

- Same basic concern as for the precoder.

- Don’t know when a change is made so you can’t lower the request flag and make a new request. Or know when to retune the local RxEq, so you have to just keep redoing it.

What could we do

- Provide a handshake from the management to the device to indicate the request has been serviced.
- Then the device could make local updates as needed.

How would we add a handshake

- Change the request_flag from a RO bit to a RW bit
  - Local device sets the bit to indicate a request for a change
  - Management clears the bit to indicate the request has been done

- For example for 1.604.1 modify the text to read:
  - This bit indicates that at least one Tx input lane is requesting a change in the precoding state. Once the remote precoder state is updated to align with the requested status in 1.606, this bit is written to a 0. Writing a 1 to this bit is ignored."

Discussion

- Discuss